

PRACTICE

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the equation by factoring.

1) $x^2 = x + 6$

A) $\{-2, -3\}$

B) $\{2, 3\}$

C) $\{1, 6\}$

D) $\{-2, 3\}$

2) $12x^2 - 4x = 0$

A) $\{0\}$

B) $\{0, \frac{1}{3}\}$

C) $\{-\frac{1}{3}, 0\}$

D) $\{\frac{1}{3}, -\frac{1}{3}\}$

Solve the equation by the square root method.

3) $(3x + 3)^2 = 36$

A) $\{-13, 13\}$

B) $\{-3, 1\}$

C) $\{1, 3\}$

D) $\{0, 1\}$

Determine the constant that should be added to the binomial so that it becomes a perfect square trinomial. Then write and factor the trinomial.

4) $x^2 - 10x$

A) $-25; x^2 - 10x - 25 = (x - 5)^2$

B) $100; x^2 - 10x + 100 = (x - 10)^2$

C) $-100; x^2 - 10x - 100 = (x - 10)^2$

D) $25; x^2 - 10x + 25 = (x - 5)^2$

Solve the equation using the quadratic formula.

5) $6x^2 + 10x + 3 = 0$

A) $\left\{\frac{-5 - \sqrt{7}}{6}, \frac{-5 + \sqrt{7}}{6}\right\}$

B) $\left\{\frac{-10 - \sqrt{7}}{6}, \frac{-10 + \sqrt{7}}{6}\right\}$

C) $\left\{\frac{-5 - \sqrt{7}}{12}, \frac{-5 + \sqrt{7}}{12}\right\}$

D) $\left\{\frac{-5 - \sqrt{43}}{6}, \frac{-5 + \sqrt{43}}{6}\right\}$

Compute the discriminant of the equation. What does the discriminant indicate about the kinds of solutions?

6) $x^2 + 8x + 7 = 0$

A) 0; 1 real solution

B) -92; no real solutions

C) 36; 2 unequal real solutions

Solve the equation by the method of your choice.

7) $(6x + 9)^2 = 4$

A) $\left\{\frac{7}{6}, \frac{11}{6}\right\}$

B) $\left\{-\frac{11}{6}, -\frac{7}{6}\right\}$

C) $\left\{-\frac{7}{6}, 0\right\}$

D) $\left\{\frac{5}{6}\right\}$

8) $4x^2 + 6x = -1$

A) $\left\{\frac{-3 - \sqrt{13}}{4}, \frac{-3 + \sqrt{13}}{4}\right\}$

B) $\left\{\frac{-3 - \sqrt{5}}{4}, \frac{-3 + \sqrt{5}}{4}\right\}$

C) $\left\{\frac{-3 - \sqrt{5}}{8}, \frac{-3 + \sqrt{5}}{8}\right\}$

D) $\left\{\frac{-6 - \sqrt{5}}{4}, \frac{-6 + \sqrt{5}}{4}\right\}$

Solve the problem.

9) The formula $N = 3x^2 + 2x + 1$ represents the number of households N , in thousands, in a certain city that have a computer x years after 1990. According to the formula, in what year were there 86 thousand households with computers in this city?

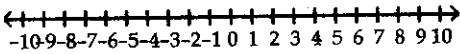
- A) 1994 B) 1995 C) 1996 D) 1993

10) A ladder that is 17 feet long is 8 feet from the base of a wall. How far up the wall does the ladder reach?

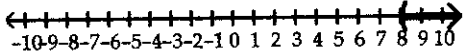
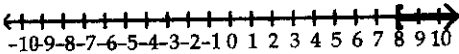
- A) $\sqrt{353}$ ft B) 225 ft C) 15 ft D) 3 ft

Solve the inequality and graph the solution set on the number line. Express the solution set using interval notation.

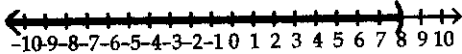
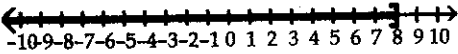
11) $4x + 9 < 41$



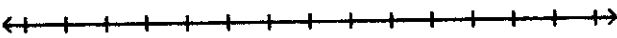
- A) $[8, \infty)$ B) $(8, \infty)$



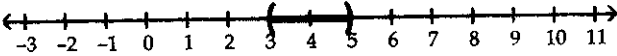
- C) $(-\infty, 8]$ D) $(-\infty, 8)$



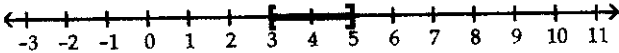
12) $20 \leq 5x + 5 \leq 30$



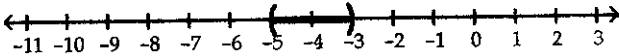
- A) $(3, 5)$



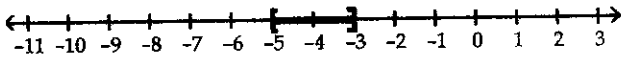
- B) $[3, 5]$



- C) $(-5, -3)$

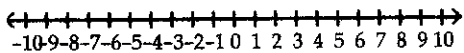


- D) $[-5, -3]$

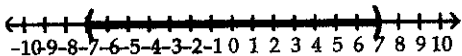


Solve the inequality by first rewriting it as an equivalent inequality without absolute value bars. Graph the solution set on the number line. Express the solution set using interval notation.

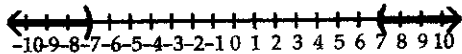
13) $|x| < 7$



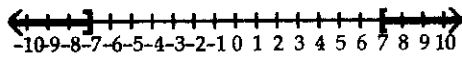
A) $(-7, 7)$



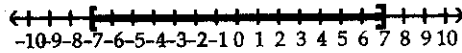
C) $(-\infty, -7)$ or $(7, \infty)$



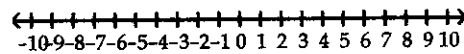
B) $(-\infty, -7]$ or $[7, \infty)$



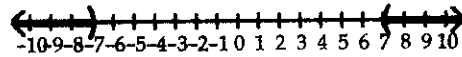
D) $[-7, 7]$



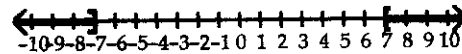
14) $|x| > 7$



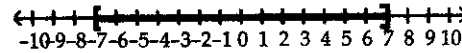
A) $(-\infty, -7)$ or $(7, \infty)$



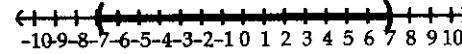
C) $(-\infty, -7]$ or $[7, \infty)$



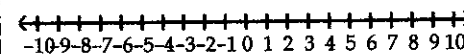
B) $[-7, 7]$



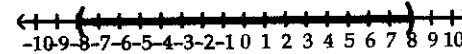
D) $(-7, 7)$



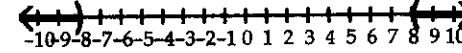
15) $\left| \frac{11y + 44}{4} \right| < 11$



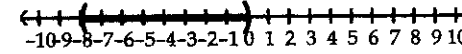
A) $(-8, 8)$



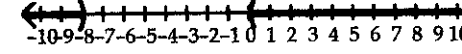
C) $(-\infty, -8)$ or $(8, \infty)$



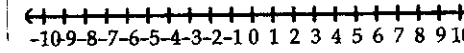
B) $(-8, 0)$



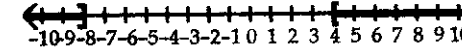
D) $(-\infty, -8)$ or $(0, \infty)$



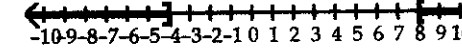
16) $5 + \left| 1 - \frac{x}{2} \right| \geq 8$



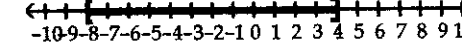
A) $(-\infty, -8]$ or $[4, \infty)$



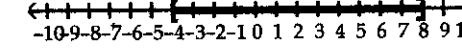
C) $(-\infty, -4]$ or $[8, \infty)$



B) $[-8, 4]$

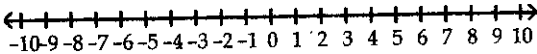


D) $[-4, 8]$



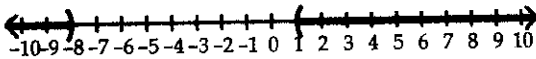
Solve the quadratic inequality and graph the solution set on a number line. Express the solution set in interval notation.

17) $(x - 1)(x + 8) > 0$

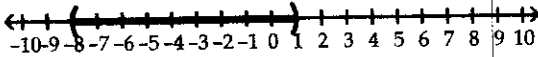


A) $(-\infty, -8) \cup (1, \infty)$

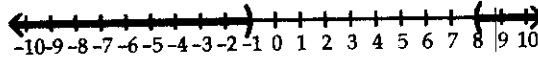
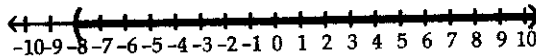
B) $(-8, 1)$



C) $(-8, \infty)$

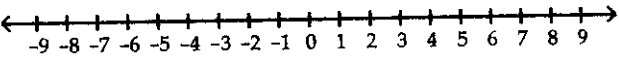


D) $(-\infty, -1) \cup (8, \infty)$

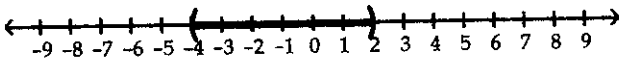


Solve the rational inequality and graph the solution set on a real number line. Express the solution set in interval notation.

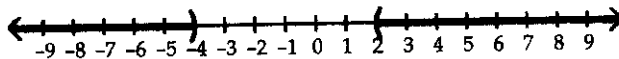
18) $\frac{x - 2}{x + 4} < 0$



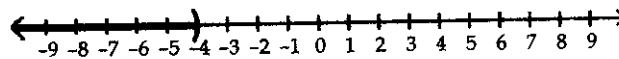
A) $(-4, 2)$



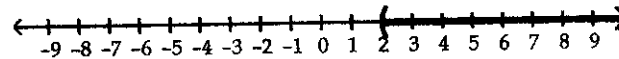
B) $(-\infty, -4) \cup (2, \infty)$



C) $(-\infty, -4)$



D) $(2, \infty)$



Find the slope of the line passing through the pair of points or state that the slope is undefined.

19) $(7, -1)$ and $(7, -3)$

A) $\frac{1}{7}$

B) $-\frac{2}{7}$

C) Undefined

D) 0

Use the given conditions to write an equation for the line in point-slope form.

20) Passing through $(2, 6)$ and $(4, 7)$

A) $y - 6 = \frac{1}{2}(x - 2)$ or $y - 7 = \frac{1}{2}(x - 4)$

B) $y - 6 = \frac{1}{2}(x - 4)$ or $y - 7 = \frac{1}{2}(x - 2)$

C) $y - 6 = 2(x + 2)$ or $y - 7 = 4(x - 6)$

D) $y + 6 = \frac{1}{2}(x + 2)$ or $y + 7 = \frac{1}{2}(x + 4)$

Use the given conditions to write an equation for the line in slope-intercept form.

21) Passing through $(-8, -8)$ and $(-3, -2)$

A) $y = mx + \frac{8}{5}$

B) $y = \frac{6}{5}x + \frac{8}{5}$

C) $y + 8 = \frac{6}{5}(x + 8)$

D) $y = -\frac{6}{5}x + \frac{8}{5}$

Determine the slope and the y-intercept of the graph of the equation.

22) $6x - 2y - 12 = 0$

A) $m = 6; (0, 12)$

B) $m = 3; (0, -6)$

C) $m = \frac{1}{3}; (0, 2)$

D) $m = -3; (0, 6)$

Use the given conditions to write an equation for the line in the indicated form.

23) Passing through $(4, 4)$ and perpendicular to the line whose equation is $y = 5x + 7$; point-slope form

A) $y = -5x - 24$

B) $y - 4 = \frac{1}{5}(x + 4)$

C) $y - 4 = -\frac{1}{5}(x - 4)$

D) $y - 4 = \frac{1}{5}(x - 4)$

24) Passing through $(4, -2)$ and parallel to the line whose equation is $y = -2x + 3$; point-slope form

A) $y - 4 = -2(x + 2)$

B) $y + 2 = -2(x - 4)$

C) $y = 2x$

D) $y + 2 = x - 4$

Find the distance between the pair of points.

25) $(6, 1)$ and $(-4, -2)$

A) 7

B) $\sqrt{109}$

C) $\sqrt{91}$

D) 30

Find the midpoint of the line segment whose end points are given.

26) $(-5, 9)$ and $(-6, 2)$

A) $(1, 7)$

B) $(-\frac{11}{2}, \frac{11}{2})$

C) $(-11, 11)$

D) $(\frac{1}{2}, \frac{7}{2})$

Write the standard form of the equation of the circle with the given center and radius.

27) $(9, 8); \sqrt{3}$

A) $(x - 8)^2 + (y - 9)^2 = 9$

B) $(x + 8)^2 + (y + 9)^2 = 9$

C) $(x + 9)^2 + (y + 8)^2 = 3$

D) $(x - 9)^2 + (y - 8)^2 = 3$

Complete the square and write the equation in standard form. Then give the center and radius of the circle.

28) $x^2 - 4x + 4 + y^2 + 12y + 36 = 49$

A) $(-2, 6), r = 49$

B) $(2, -6), r = 7$

C) $(6, -2), r = 49$

D) $(-6, 2), r = 7$

Find the domain and range of the relation.

29) $\{(8, 6), (15, -7), (7, -5), (3, -6), (4, -9)\}$

A) domain = $\{3, 15, 7, 8, 4\}$; range = $\{-6, -7, -5, 6, -9\}$

B) domain = $\{3, -6, 15, -7, 7\}$; range = $\{-5, 8, 6, 4, -9\}$

C) domain = $\{-6, -7, -5, 6, -9\}$; range = $\{3, 15, 7, 8, 4\}$

D) domain = $\{-5, 8, 6, 4, -9\}$; range = $\{3, -6, 15, -7, 7\}$

Determine whether the relation is a function.

30) $\{(-4, -9), (-1, 4), (1, -1), (1, -3)\}$

A) Not a function

B) Function

Determine whether the equation defines y as a function of x.

- 31) $6x = 4 - 3y$
- A) y is not a function of x
- B) y is a function of x

Evaluate the function at the given value of the independent variable and simplify.

- 32) $f(x) = 3x^2 - 3x + 7$; $f(x - 1)$
- A) $3x^2 + 18x + 7$
- B) $-9x^2 + 3x + 13$
- C) $3x^2 - 9x + 7$
- D) $3x^2 - 9x + 13$

Evaluate the piecewise function at the given value of the independent variable.

- 33)
- $$f(x) = \begin{cases} -2x + 4 & \text{if } x < -4 \\ 2x + 2 & \text{if } x \geq -4 \end{cases}$$

Determine $f(-6)$.

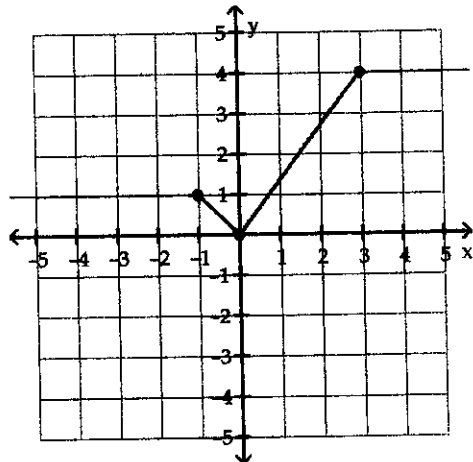
- A) -8
- B) 18
- C) 16
- D) 12

Find the domain of the function.

- 34) $f(x) = 5x^2 + 3x - 4$
- A) $(0, \infty)$
- B) $(-\infty, \infty)$
- C) $(-\infty, 0)$
- D) $(-\infty, 0)$ or $(0, \infty)$
- 35) $f(x) = \sqrt{18 - x}$
- A) $(-\infty, \infty)$
- B) $(-\infty, 18]$
- C) $(-\infty, 18)$ or $(18, \infty)$
- D) $(\sqrt{2}, \infty)$

Identify the intervals where the function is changing as requested.

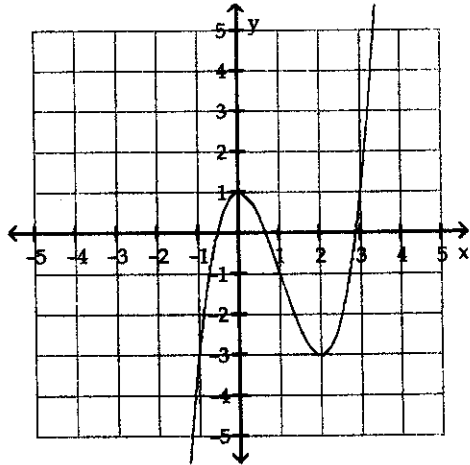
- 36) Constant



- A) $(-1, 0)$
- B) $(-\infty, -1)$ or $(3, \infty)$
- C) $(-\infty, 0)$
- D) $(3, \infty)$

Use the graph of the given function to find any relative maxima and relative minima.

37) $f(x) = x^3 - 3x^2 + 1$



- A) maximum: (0, 1); minimum: none

B) no maximum or minimum
- C) maximum: (0, 1); minimum: (2, -3)

D) maximum: none; minimum: (2, -3)

Find the average rate of change of the function from x_1 to x_2 .

38) $f(x) = \sqrt{2x}$ from $x_1 = 2$ to $x_2 = 8$

- A) $-\frac{3}{10}$

B) $\frac{1}{3}$
- C) 2

D) 7

Determine whether the given function is even, odd, or neither.

39) $f(x) = x^3 - 5x$

- A) Neither

B) Odd

C) Even

If $f(x) = \text{int}(x)$, find the function value.

40) $f(-3)$

- A) -3

B) -4

C) -2

D) 1

Given functions f and g , perform the indicated operations.

41) $f(x) = 6x - 6, g(x) = 8x + 7$

Find fg .

- A) $14x^2 - 6x + 1$

B) $48x^2 - 42$

C) $48x^2 - 41x - 42$

D) $48x^2 - 6x - 42$

For the given functions f and g , find the indicated composition.

42) $f(x) = 8x^2 - 8x, g(x) = 13x - 7$

$(f \circ g)(1)$

- A) -7

B) 240

C) 0

D) 247

43) $f(x) = 8x + 9, g(x) = 4x - 1$

$(f \circ g)(x)$

- A) $32x + 17$

B) $32x + 1$

C) $32x + 35$

D) $32x + 8$

Which two functions are inverses of each other.

44) $f(x) = \frac{x-7}{2}$ $g(x) = 2x-7$ $h(x) = \frac{x+7}{2}$

- A) $f(x)$ and $h(x)$ B) $f(x)$ and $g(x)$ C) $g(x)$ and $h(x)$ D) None

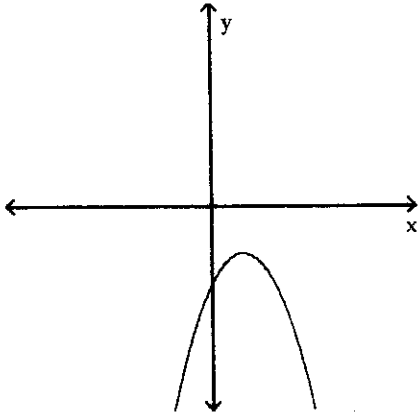
Find the inverse of the one-to-one function.

45) $f(x) = -5x - 6$

- A) $f^{-1}(x) = \frac{x-6}{-5}$ B) $f^{-1}(x) = \frac{x+6}{-5}$ C) $f^{-1}(x) = \frac{y+6}{-5}$ D) $f^{-1}(x) = \frac{-5x+6}{-5}$

Does the graph represent a function that has an inverse function?

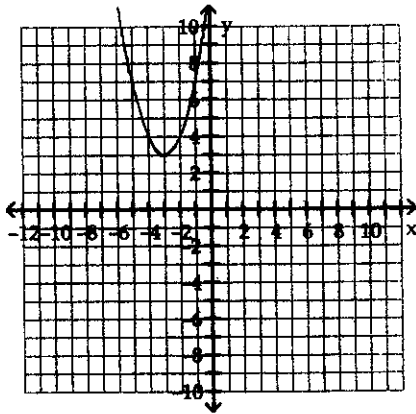
46)



- A) Yes B) No

The graph of a quadratic function is given. Determine the function's equation.

47)



- A) $j(x) = (x-3)^2 - 3$ B) $g(x) = (x+3)^2 - 3$ C) $f(x) = (x+3)^2 + 3$ D) $h(x) = (x-3)^2 + 3$